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Eugene LeDonne, Esq.
Reed Smith LLP
375 Park Ave, 17th Floor
New York, NY 10152

| EXAMINER | |
|---|---|
| TAYLOR, BARRY W | |
| ART UNIT | PAPER NUMBER |
| 2643 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/729,562 | SMITH ET AL. | |
| | Examiner | Art Unit | |
| | Barry W Taylor | 2643 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on 09 December 2002 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-50 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-50 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Randle et al (6,263,047 hereinafter Randle) in view of Kochan (6,104,197).

Regarding claims 1, 23, 38 and 47. Randle teaches a system and method for determining the suitability of a communication line for xDSL service use via single ended analysis (see figure 4), comprising:

measuring characteristic parameters of at least one communication line to be tested at one end of the at least one communication line (Title, abstract, columns 1-6, figures 5A-5B, 7 and 12, 8A-8B);

determining a plant map of the at least one communication line (Title, abstract, columns 1-6, figures 5A-5B, 7 and 12, 8A-8B);

determining a transfer function representative of the plant map of the at least one communication line (Title, abstract, columns 1-6, figures 5A-5B, 7 and 12, 8A-8B); and

analyzing the transfer function so as to qualify the at least one communication line (Title, abstract, columns 1-6, figures 5A-5B, 7 and 12, 8A-8B).

According to Applicant's, Randle is only concerned with detecting load coils and is silent with respect to "transfer function representative of the plant map" (see second full paragraph on page 4 of paper number 10 dated 5/24/02). However, Applicant's admit that circuit modeling systems that are used to generate transfer functions are well known in the art (see Applicant's detailed specification page 11 lines 34-37). In other words, Randle only uses TDR to determine loading pattern (i.e. bridge taps) of a communication line.

Kochan teaches an apparatus for acquiring waveform data that uses TDR for examining transmission cable (Title, abstract). Kochan improves on conventional TDR systems (columns 1-2) by acquiring waveform data in such a manner as to allow the detection and characterization of **events** with low return signals (columns 2-3). Kochan even allows for TDR waveform data to be acquired over segment length or multiple segment lengths as well as displaying characteristic data with regards to particular events (col. 3 line 5 – col. 4 line 67, col. 6 lines 5-11, line 19, lines 47-57). Kochan even discloses using return loss and event return loss of an event for defining a particular

event (columns 7-8). Kochan discloses using table of gain settings (i.e. 0db – 72 db) as well as using areas above and below trace data, etc. (see figures 3-5, columns 9-36).

It would have been obvious for any one of ordinary skill in the art at the time of the invention was made to modify the conventional TDR system as taught by Randle to use wave form data as taught by Kochan so that **all** events in the acquired waveform data may be detected and characterized as taught by Kochan.

Regarding claim 2. Randle teaches using single-ended analysis to measure and model telecommunications transmission lines (figure 4, col. 8 lines 16-28).

Regarding claim 3. Randle teaches the characteristic parameters includes at least one of a wire gauge (figure 12, col. 3 lines 36-47, col. 4 lines 15-18, col. 5 lines 27-37, col. 6 lines 10-27, col. 11 lines 24-60, col. 17 lines 12+), length (col. 1 lines 38-61, col. 8 line 66 – col. 9 line 12, col. 9 lines 29-67, col. 15 lines 13-38, col. 16 lines 17-54).

Regarding claim 4. Randle teaches the characteristic parameters include the presence of shorts (col. 1 lines 13-21, figures 3A-3C, col. 7 lines 20-25, col. 9 lines 13-25, col. 10 lines 43-67, col. 12 lines 61-67, col. 13 lines 1-25).

Regarding claim 5. Randle does not explicitly show measuring longitudinal balance.

Kochan teaches an apparatus for acquiring waveform data that uses TDR for examining transmission cable (Title, abstract). Kochan improves on conventional TDR systems (columns 1-2) by acquiring waveform data in such a manner as to allow the detection and characterization of **events** with low return signals (columns 2-3). Kochan even allows for TDR waveform data to be acquired over segment length or multiple

segment lengths as well as displaying characteristic data with regards to particular events (col. 3 line 5 – col. 4 line 67, col. 6 lines 5-11, line 19, lines 47-57). Kochan even discloses using return loss and event return loss of an event for defining a particular event (columns 7-8). Kochan discloses using table of gain settings (i.e. 0db – 72 db) as well as using areas above and below trace data, etc. (see figures 3-5, columns 9-36).

It would have been obvious for any one of ordinary skill in the art at the time of the invention was made to modify the conventional TDR system as taught by Randle to use wave form data as taught by Kochan so that **all** events in the acquired waveform data may be detected and characterized as taught by Kochan.

Regarding claim 6. Randle teaches the characteristic parameters include load coils (col. 1 lines 5-11, col. 2 lines 11-17).

Regarding claims 7, 17 and 50. Randle does not explicitly show wideband noise.

Kochan teaches an apparatus for acquiring waveform data that uses TDR for examining transmission cable (Title, abstract). Kochan improves on conventional TDR systems (columns 1-2) by acquiring waveform data in such a manner as to allow the detection and characterization of **events** with low return signals (columns 2-3). Kochan even allows for TDR waveform data to be acquired over segment length or multiple segment lengths as well as displaying characteristic data with regards to particular events (col. 3 line 5 – col. 4 line 67, col. 6 lines 5-11, line 19, lines 47-57). Kochan even discloses using return loss and event return loss of an event for defining a particular event (columns 7-8). Kochan discloses using table of gain settings (i.e. 0db – 72 db) as well as using areas above and below trace data, etc. (see figures 3-5, columns 9-36).

It would have been obvious for any one of ordinary skill in the art at the time of the invention was made to modify the conventional TDR system as taught by Randle to use wave form data as taught by Kochan so that **all** events in the acquired waveform data may be detected and characterized as taught by Kochan.

Regarding claims 8-9, 18. Randle teaches loop attenuation (see figure 4 wherein the device transmits known pulse waveforms along the copper wire which is used to show attenuations indicative of various conditions, including the presence or absence of shorts, opens, taps, different wire gauges, effects of water, etc).

Regarding claims 10, 28, and 43. Randle shows a plant map used for determining the presence of characteristics and anomalies (see "modeled" and "modeling" –abstract, columns 1-6).

Regarding claim 11. Randle shows the characteristics of length (col. 1 lines 38-61, col. 8 line 66 – col. 9 line 12, col. 9 lines 29-67, col. 15 lines 13-38, col. 16 lines 17-54), shorts (col. 1 lines 13-21, figures 3A-3C, col. 7 lines 20-25, col. 9 lines 13-25, col. 10 lines 43-67, col. 12 lines 61-67, col. 13 lines 1-25), and damage to the communication line (see lightening strikes column 1).

Regarding claims 12, 29 and 44. Randle shows using complex impedance (col. 8 line 35 – col. 9 line 60).

Regarding claims 13, 19 and 48. Randle shows performing circuit-modeling analysis on the plant map (figures 5A-5B, figure 7, figure 12).

Regarding claims 14, 20 and 49. Randle shows using a transfer function (figure 12) representative of the plant map.

Regarding claims 15-16, 21-22, 30-31, and 45-46. Randle does not explicitly show using SNR and bit rate.

Kochan teaches an apparatus for acquiring waveform data that uses TDR for examining transmission cable (Title, abstract). Kochan improves on conventional TDR systems (columns 1-2) by acquiring waveform data in such a manner as to allow the detection and characterization of **events** with low return signals (columns 2-3). Kochan even allows for TDR waveform data to be acquired over segment length or multiple segment lengths as well as displaying characteristic data with regards to particular events (col. 3 line 5 – col. 4 line 67, col. 6 lines 5-11, line 19, lines 47-57). Kochan even discloses using return loss and event return loss of an event for defining a particular event (columns 7-8). Kochan discloses using table of gain settings (i.e. 0db – 72 db) as well as using areas above and below trace data, etc. (see figures 3-5, columns 9-36).

It would have been obvious for any one of ordinary skill in the art at the time of the invention was made to modify the conventional TDR system as taught by Randle to use wave form data as taught by Kochan so that **all** events in the acquired waveform data may be detected and characterized as taught by Kochan.

Regarding claims 24-25, 39-40. See figure 4.

Claims 26 and 41 are rejected for the same reason as method claims 4-8 listed above.

Regarding claims 27 and 42. See figure 4.

Regarding claims 32-33. Randle teaches loop attenuation (columns 1-6, col. 8 lines 7-65, col. 9 line 51 – col. 19 line 24, see figure 4 wherein the device transmits

known pulse waveforms along the copper wire which is used to show attenuations indicative of various conditions, including the presence or absence of shorts, opens, taps, different wire gauges, effects of water, etc).

Regarding claims 34-36. Randle shows comparing the trace simulation with actual trace and changing parameters of the trace to match the actual trace (col. 11 line 24 – col. 19 line 24, figures 4, 5A-5B, 7 and 12).

Regarding claim 37. Randle shows using backscatter (see figure 12 wherein portions of the trace follows an impairment and has a unique shape for each gauge due to different parameters).

***Response to Arguments***

2. Applicant's arguments filed 12/9/02 have been fully considered but they are not persuasive.

a) Regarding Applicant's brief remark on page 5 wherein Applicant's appear to be confused (see first full paragraph on page 5).

The Examiner reminds Applicant's that is was Applicant's who firstly stated that: Randle is only concerned with detecting load coils and is silent with respect to "transfer function representative of the plant map" (**see second full paragraph on page 4 of paper number 10 dated 5/24/02**). However, Applicant's admit that circuit modeling systems that are used to generate transfer functions are well known in the art (see Applicant's detailed specification page 11 lines 34-37). In other words, Randle only uses TDR to determine loading pattern (i.e. bridge taps) of a communication line. Furthermore, Kochan allows for small events to be detected and characterized ***thus***

***yielding a more accurate characterization of the line under test*** (the Examiner pointed this out to Applicant's already (see rejection listed above, as well as, Examiner's previous rejection dated 8/8/02, paper number 11).

b) Regarding Applicant's brief remark at the bottom of page 5 wherein Applicant's contend that neither reference analyzes the "transfer function".

First of all, both Randle and Kochan teach using TDR. In fact, Randle even stores known models and indeed displays such "transfer function" see figures 5A and 5B wherein db verses frequency are pictorially represented. The Examiner agrees that Randle does not explicitly show determining the suitability of a communication line for xDSL service. However, one of minimum skill in the art would readily recognize the importance of characterizing the loading pattern of the telecommunications transmission line with respect to wire gauge, length, presence of bridge taps and load coils when qualifying existing copper lines for xDSL services.

c) Regarding Applicant's comment at the bottom of page 5 wherein Applicant's allege that Kochan is solely concerned with increasing the sensitivity of the TDR. The Examiner notes that Kochan invention as includes an event table containing "characterization data on detected events within each gain segment acquisition of waveform data" (see starting at column 4 line 7+). It appears that Applicant's have only read the first three columns of Kochan.

d) Applicant's further contend that Kochan is not concerned with a digital subscriber line (see lines 2-4 on page 6).

The Examiner directs Applicant's attention to column 7 line 24 wherein Kochan discloses that TDR may be used in testing digital services. Kochan allows for small events to be detected and characterized ***thus yielding a more accurate characterization of the line under test*** (the Examiner pointed this out to Applicant's already (see rejection listed above, as well as, Examiner's previous rejection dated 8/8/02, paper number 11).

### *Conclusion*

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry W. Taylor whose telephone number is (703) 305-4811. The examiner can normally be reached on Monday-Friday from 6:30am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on (703) 305-4708. The fax phone number for this Group is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Technology Center 2600 customer service Office whose telephone number is (703) 306-0377.

CURTIS KUNTZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600